

ON THE NESTS AND HABITS OF AUSTRALIAN
VESPIDÆ AND *LARRIDÆ*.

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The following notes are the records of personal observations extending over a number of years. These wasps are probably best known to most people on account of their fearless disposition and their sociable habits, for they not only build under the eaves and verandahs of houses, but even come inside to construct their nests.

The *Vespidæ* comprise a number of social wasps which form large papery nests, the work of the original builders being supplemented by that of the young wasps as they hatch out, so that an old nest sometimes attains considerable dimensions. Others are solitary; a single pair build the nest, which is composed of clay, and after it is completed, each cell is filled with provisions and the ends sealed up, the larvæ being left to look after themselves.

The two species of *Pison* also build clay nests exclusively, and these are provisioned with spiders, which they capture upon the grass and low bushes.

The value of these insects from an economic point of view is doubtful, for while those that destroy caterpillars are worthy of protection as the gardener's friend, those that prey upon spiders rather counter-balance their usefulness in killing the allies of the horticulturist.

ALASTOR ERIURGUS, Saussure, Mon. Guêpes Solitaires, Vol. i.
p. 251.

A very common "mason wasp" in the neighbourhood of Sydney; very plentiful in February and March.

Velvety black, about 8 lines in length, covered with scattered ferruginous hairs thickest on the head and frontal portion of

thorax; head and thorax closely and coarsely punctured, the segments of the abdomen covered with much finer punctures partly hidden by the fine pubescence clothing the dorsal surface; the face, the inner margin of scape, and a slender v-shaped patch between them, the tibiæ, tarsi, the prothorax, a circular spot on the side, the scutellum, post-scutellum, and a patch on either side of apex of the metathorax deep orange-yellow. The first segment of abdomen orange-yellow with a blackish blotch at the base, second segment very broad and prominent, velvety black, with the apical edge orange-yellow; the three following segments dull orange-yellow, with a narrow line of black at base, and tip dull orange-yellow; the wings large, fuscous, with the nervures black.

The nests are formed on the underside of the overhanging branches of trees, a hollow or depression in the bark being generally chosen for the site. They are invariably composed of bright yellow clay (which makes them very conspicuous), forming several coarsely granulated tubular masses, six lines in diameter, and from two and a half to three inches in length, each containing six or seven cylindrical chambers rounded at the extremities, and separated from each other by a thin clay partition.

Each nest consists of from two to five of these tubular cell-masses, sometimes lying beside each other, but generally when there are more than two or three, the last ones are built along the top of the basal rows; each cell is provisioned with from 18 to 20 small lepidopterous caterpillars, which are eaten as required by the wasp larvæ; the latter when they have emptied their larder do not spin a cocoon to pupate in, but the walls of the chamber are covered with a thin membranous skin fitting closely to the clay. They are subject to the attacks of cuckoo wasps and other parasitic hymenoptera; in one nest I found a small *Bracon* larva beside the young *Alastor*, which it soon devoured, and then spun an elongate white silken cocoon, out of which it emerged ten days after; $2\frac{1}{2}$ lines in length, black, with reddish legs, the hind thighs very much thickened; a beautiful sabre-shaped exerted ovipositor as long as the whole abdomen. The cuckoo wasps (*Chrysis* sp.) are very common in this nest; they eat up

the provisions stored for the young wasp, and perhaps also the young wasp, forming a stout brown silken cocoon in which to pupate ; I have bred out several specimens. These inquilines are placed in the *Alastor* nest while the builders are out hunting for caterpillars, their active mothers being on the watch to crawl in and deposit the eggs in the owner's absence.

ABISPA SPLENDIDA, Guérin, Voyage de la Coquille, 1830, Insecta, p. 265.

Among our "mason or mud wasps" this takes the palm for being one of the largest and handsomest, only equalled by the closely allied but very distinct species *A. ephippium*. It is $1\frac{1}{4}$ inches in length, very broad and robust, with semi-opaque reddish-orange wings slightly clouded with fuscous at the tips ; the wasp is rich velvety black, with the antennæ, face, an elongate mark behind the eyes, the prothoracic collar, and the sides of the metathorax bright orange-yellow ; a narrow band of the same colour along the apical edge of the first and second segments of the abdomen, the third, fourth, fifth and sixth rich orange-yellow, only showing a marginal black band at base, while the anal segment and the underside of the four apical ones are orange-yellow. The male and female are generally found together when the site of the nest is chosen, though whether the male assists in its construction I am not certain, but I believe he does.

The nest is very compact and solid, attached to the bark of an overhanging tree, roof of an outhouse, or some sheltered position ; it is $5\frac{1}{2}$ inches long, $2\frac{1}{4}$ inches wide, and $1\frac{1}{2}$ inches thick, rough on the outer surface, showing where each ball of clay has been attached, rounded at each extremity ; along the centre opening out towards the side is a row of six tubular cells, $1\frac{1}{2}$ inches deep and 4 lines in diameter. The nest when finished is provisioned with small lepidopterous caterpillars, which are captured on the grass, and after being stung are jammed into the cell till it is quite full, the aperture being closed with a thin sheet of clay. The larva, after finishing its food supply, does not spin any cocoon, but undergoes its metamorphosis naked.

This wasp is recorded from Tasmania and Australia ; I have specimens from the neighbourhood of Sydney, and Wellington, N.S.W.

The nest from which my specimens were bred was given to me by Mr. Thos. Whitelegge of the Australian Museum.

ICARIA GREGARIA, Saussure, Ent. Zeit. Stettin, xxiii. p. 137 (1862).

This wasp is much smaller than those of the genus *Polistes*, and is easily distinguished from them by having the apical segments of the abdomen telescopic and retracted into each other, while the former have smooth cylindrical sharply pointed abdomens.

This species is five lines in length ; ferruginous with touches of reddish-yellow on the sides of the thorax, the first joint of the abdomen very slender, the remaining segments chocolate-brown with a beautiful opaline sheen ; the wings large, semi-opaque, with reddish nervures.

The nests are formed of a stouter and stiffer substance than those of *Polistes*, and are always much longer than broad and irregular in form. About Sydney I have always found them built among the prickly twigs of *Busaria spinosa*, with the exception of one found under a cliff attached to the rock. An average well-shaped nest is about 4 inches in length by $1\frac{1}{4}$ inches wide, and contains about 300 hexagonal cells, 5 lines in depth by $1\frac{3}{4}$ lines in diameter. Though these nests are often so elongated, they are usually only attached to the twigs by one pedicle. The eggs and larvæ are attended to in the same manner as those of *Polistes*.

This species is rather common about Sydney and out in the western country ; I have also received specimens of it from the Rev. T. Blackburn of Adelaide, taken by him on the Australian Alps (Victoria) at an altitude of 3000 feet.

POLISTES TASMANIENSIS, Sauss., Mon. Guêpes Sociales, p. 66, 23, t. 6, f. 5.

This wasp is $6\frac{1}{2}$ lines in length, generally of a uniform rusty reddish colour, with the antennæ, legs, and sides of prothorax dull

yellow, but the coloration is very variable, often shading into bright yellow or brown; the wings are small, orange-red, and opaque.

The nest is formed of a brown papery substance like that produced by all of these "paper-nest wasps" from some wooden surface exposed to the weather. I have often watched them on a shingle roof obtaining a plentiful supply, which, mixed with their saliva and desiccated, is formed into a fine waterproof brown paper. The nest is commenced by a stalk or pedicle about a third of an inch in length, at the apex of which is formed the first cell; two wasps generally commence the structure, and attach the first eggs to the top of the cells as soon as they have three or four completed. The larvæ soon hatch out and hang head downwards, being fed by their attendant nurses with spiders that they have first masticated and reduced to a pulp. When full-grown the young larvæ spin a silken cap over the aperture, and within a very short time appear as full-grown wasps, and at once commence to work at the nest, so that the colony increases rapidly when once they begin to hatch out.

The nests are always circular and often attain the size of an ordinary saucer; the cells are peaked at the top, but hexagonal at the apex, about 10 lines deep and 3 lines in diameter; an ordinary-sized nest three inches in diameter contains about 250 cells. This wasp is of a very domesticated disposition, being very fond of building its nest under verandahs and the eaves of houses; but as they are very aggressive when disturbed they are not always welcome additions to the household.

It has a wide range over Australia, and is very common in S. Australia, Victoria, and New South Wales.

POLISTES FACILIS, Sauss., Mon. Guêpes Sociales, p. 539.

This wasp seems to take the place of the smaller species in the south-western parts of New South Wales. I have found it very common in the Yass district.

Length 10 lines. Colour dull orange-yellow, with the vertex, coxæ, basal portion of the fore legs, and all the underside of head

and thorax black ; in the middle and hind legs the black extends almost, but not quite up to the tibiæ ; the upper surface of the thorax black, except the prothorax and scutellum ; the first segment of the abdomen black, narrowly margined with yellow at the apex ; the second yellow, banded with black at the base ; the third only very slightly marked with black at the base ; on the ventral side of the base of abdomen and an oval patch extending into the third segment black. Wings pale horn-yellow with deep orange-yellow nervures, slightly clouded along the hind margins with fuscous.

P. facilis is one of the largest and most savage members of this genus that I know. It forms a brown papery nest of a slightly irregular circular form, attached by a stout pedicle, as in *P. tasmaniensis*, whose nest it closely resembles, except in the size of the cells, which are somewhat bigger, though I have never seen a very large nest formed by this species. They inflict a very severe sting, and attack one the moment they are disturbed, and as they generally construct their nests in hollow or burnt logs on the ground, the collector while turning these over for ground insects is often startled by their angry hum.

POLISTES TEPIDUS, Fabr., Syst. Ent. p. 366, 17.

The only specimens of this fine wasp that I have seen were presented to me by Mr. W. S. Dun, of the Geological Department, who informed me that they were taken with the nest on the Kogarah side of Botany Bay.

Length 10 lines. Colour black ; the antennæ, the face, jaws, a transverse narrow mark above the insertion of the antennæ, the apex of the femora, the tibiæ and tarsi of the fore and middle legs, a slight patch at the junction of femora, and the tarsi of hind legs bright orange-yellow ; the prothoracic girdle and wings reddish-yellow, slightly clouded with fuscous at hind margins ; apical portion of second abdominal segment and the whole of the following ones dull orange-yellow.

The nest is formed with a stout pedicle in the same manner as that of *P. tasmaniensis*, but the cells are very much larger.

PISON DECIPIENS, Smith, Trans. Ent. Soc. London, 1869, p. 294.

This little wasp was described from Champion Bay, W.A.; but is also very plentiful in most parts of N. S. Wales.

Length 3 lines; broad black head and thorax, with the antennæ and legs dull yellow; abdomen small, much constricted at the segmental divisions, base of the first segment, a narrow line at base of second, about two-thirds of the basal portion of third, and faint markings on the anal ones black, the rest of abdomen horn-yellow.

The nest consists of four or five rounded, elongate, irregularly formed, clay cells, 4-6 lines in length, and 3-4 lines in diameter, with a smooth finely granulated surface, very thin and delicate; they are provisioned with small spiders, and the larvæ before pupating spin a stout dark brown silken cocoon.

They are not particular where they build, sometimes coming into the house and attaching the nests to clothes hanging up in a room or upon a wall in a most haphazard manner; in the bush they are sometimes attached to blades of grass or leaves. Each cell is formed separately, but they are usually attached to each other, and sometimes look like three or four little eggs made of clay.

The larvæ are much infested by one of the cuckoo or ruby-tailed flies (*Chrysis transversus*, Sm.). This is a very small species, $2\frac{1}{2}$ lines in length, somewhat smaller than its host. Head, thorax, and abdomen closely and deeply punctured, of a brilliant metallic blue colour with green tints upon the sides.

The nests from which I bred these specimens were sent to me by Miss King of Homebush.

PISON SPINOLÆ, Shuck., Trans. Ent. Soc. ii. p. 79, 1837.

This is a short, stout, black wasp, six lines in length, with the face and thorax covered with fine short hairs, the abdomen oval, with the divisions of the segments marked with a silvery pubescence forming a distinct band; the wings are large, transparent, slightly clouded with brown, darkest at tips.

The nest is a neat but somewhat fragile structure, consisting of about six chambers, 4 lines in width and 5 in length, separated from each other by a thin partition; the nest is elongate, containing only one row of cells, the outer surface very much granulated from the balls of mud not being smoothed down as each is added to the structure; the walls are so very thin that it is almost impossible to remove the nest without its crumbling to pieces. Each cell, after the egg is deposited, is stored with small spiders, and when the larva has finished up the supply it spins a stout silken cocoon. This wasp is remarkable for its reckless habit of making its nest in any hole or cranny it comes across, frequently coming into houses and making its cells in a keyhole, empty rung hole in a chair, or any other aperture that takes its fancy, which slipshod choice of a home often causes the untimely destruction of its establishment.

About two months ago, while waiting for a train at the Oatley platform, I saw the stationmaster pull down a notice board, at the back of which there was a grooved hollow, which had been recently adapted by a *Pison* to form its nest; it consisted of six cells, from which I took forty torpid spiders.

This species is found in Tasmania, Victoria, S. Australia, and most parts of New South Wales. I am indebted to Miss King of Homebush for several nests, from which I have bred specimens.